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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,627	04/09/2004	Carlos Angulo Barrios	1153.087US1	8932
21186	7590	06/17/2005	EXAMINER	
SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A. P.O. BOX 2938 MINNEAPOLIS, MN 55402-0938			PAK, SUNG H	
			ART UNIT	PAPER NUMBER
			2874	

DATE MAILED: 06/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/821,627	BARRIOS ET AL.
	Examiner	Art Unit
	Sung H. Pak	2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_ is/are allowed.
- 6) Claim(s) 1-21 is/are rejected.
- 7) Claim(s) \_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 09 April 2004 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3-7, 10, 15, 17-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Liu (US 6,788,727 B2).

Liu discloses an optical device with all the limitations set forth in the claims, including: an electro-optic modulator (column 5 lines 19-23) comprising: a substrate (Fig. 8); a planar micro-cavity supported by the substrate (817- Fig. 8); a first Bragg reflector on a first side of the micro-cavity (815a- Fig. 8); a second Bragg reflector on a second side of the micro-cavity (815b- Fig. 8); a modulator that modulates a refractive index of the cavity (column 4 lines 45-50); wherein the Bragg reflectors are distributed Bragg reflectors, comprising alternating areas having high and low refractive indices (column 6 lines 51- column 7 lines 23); wherein the device further comprises a rib extending through the cavity and Bragg reflectors (Fig. 4, column 7 lines 24-46); wherein the device further comprises a lateral trench in the micro-cavity on both sides of the modulator (Fig. 7, column 9 lines 41-52);

wherein the device further comprises an insulative layer formed on the substrate between the substrate and the micro-cavity and Bragg reflectors (809- Fig. 8).

Claims 1-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Onischenko (WO 02/079863 A2).

Onischenko discloses an optical device with all the limitations set forth in the claims, including: a silicon substrate (Fig. 1, page 5, line 19); an insulator formed on the silicon substrate (page 5 line 19); a planar micro-cavity formed on the insulator (Fabry-Perot cavity: page 6 lines 23-25); a first Bragg reflector formed on a first side of the micro-cavity (Fig. 3); a second Bragg reflector formed on a second side of the micro-cavity (Fig. 3); a rib extending through the cavity and Bragg reflectors (Fig. 8-9); a PIN diode formed on the micro-cavity that modulates a refractive index of the cavity (page 10 lines 19-24); a lateral trench in the micro-cavity on both sides of the modulator (page 5 line 19- page 7 line 6);

wherein the distributed Bragg reflectors comprise alternating area having high and low refractive indices, wherein the high refractive index sections are formed of Si (silicon), and the low refractive index sections are formed of SiO<sub>2</sub> (silica) (page 5 lines 19-24);

wherein the device further comprising insulative layer formed on the substrate between the substrate and the micro-cavity and Bragg reflectors (83- Fig. 8).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2, 9, 11-14, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu (US 6,788,727 B2) in view of Uomi et al (US 5,132,981).

Liu discloses an optical device with limitations set forth in the claims as discussed above, except it does not explicitly teach the use of PIN diode that modulates refractive index of the cavity.

On the other hand, the use of PIN diode for modulating refractive index of the optical modulator material is known in the art, for example, taught by Uomi (column 11 lines 24-56). The use of PIN diodes are well known to be advantageous and desirable in the art because it allows for fast, and reliable optical modulation with relatively low power consumption. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the device of Liu to use PIN diode as taught by Uomi.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sung H. Pak whose telephone number is (571) 272-2353. The examiner can normally be reached on Monday- Friday, 9AM-5PM.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sung H. Pak  
Patent Examiner  
Art Unit 2874

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